

Redefining 'ART': Examining the Priorities of Riders of Asheville Redefines Transit Across Income Categories



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Background

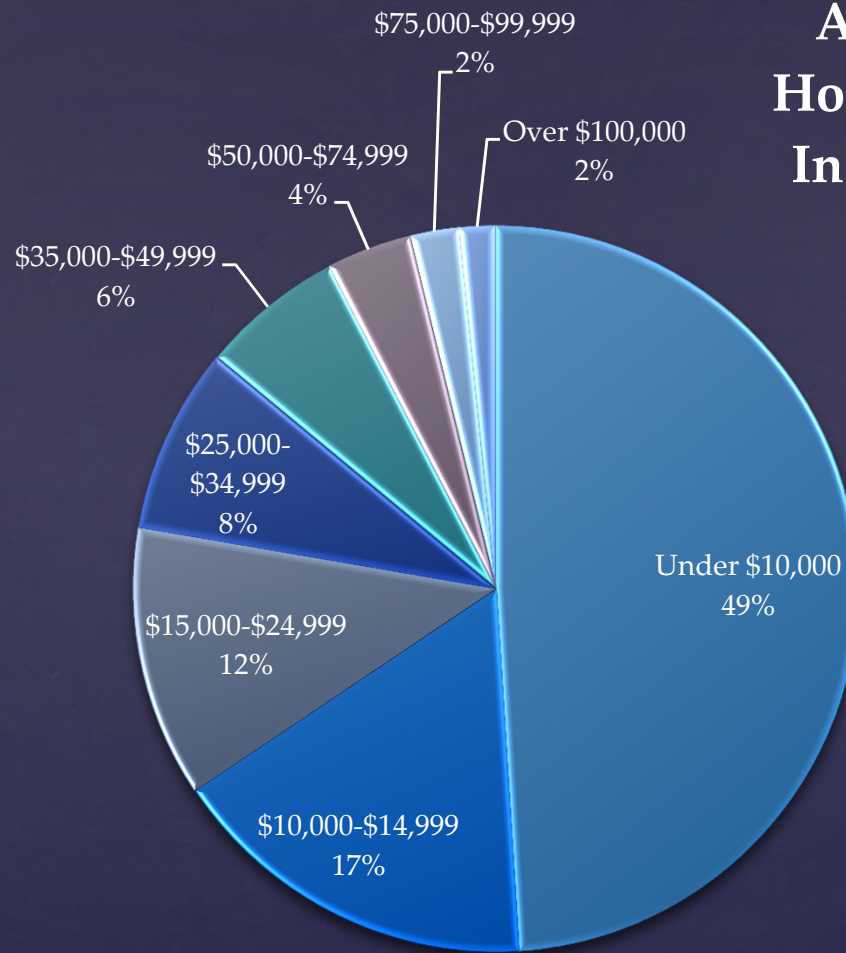
- Asheville Redefines Transit (ART) is a bus public transit system that serves 87,000 residents in the city
- A 2013 survey was commissioned by nonprofit Just Economics to measure ridership's priorities, later adopted by the City of Asheville

ART predominantly serves as a social welfare system to help marginalized Asheville residents complete basic needs.

- 49% of riders reported an income lower than the federal poverty level of \$11,770
- 33% of survey respondents considered themselves disabled
- 63% of respondents identified the bus as their only transportation option



“What is Your Annual Household Income?”



Ridership of ART is predominantly low income: 78% of ART ridership self reported income lower than \$24,999.

Daniel Matchar, 2014 Report on Survey Results

Background

- When making transit planning decisions, the needs of non-elective ridership must be prioritized. Planners must consider equity in public transit.
- City planners have to mitigate conflict between strong demand for services between low-income and minority inner-city residents and a more mobile upper class.
- 1 in 5 Asheville residents subsist at poverty level.
- 11.5% of Asheville residents rely on government assistance.
- The likelihood of an Asheville resident reaching the top fifth of income from the bottom fifth is 6.3% (Equality of Opportunity Project)



Asheville Transit Station,
"TheVintageUrbanite" at WordPress

Purpose

- The purpose of this study is to create a case study for equitable planning principles: is there justification for organizing transit system improvements primarily around the needs of the poor and marginalized?
- This study uses the most recent city transit survey data to look at whether low income or high income ridership assigned more importance to transit system changes and desired improvements.



W2 Route, serving West Asheville through Patton Ave

Methodology

- Data source: 2013 survey designed by Asheville nonprofit Just Economics
- Survey measured basic demographics of ridership, buses used, and their responses to changes made by ART and changes they wished to see in ART
- Respondents asked to pick from a numerical scale of either 1-5 for changes already implemented by ART, or 1-3 for desired changes, with 1 being the lowest value for both

ASHEVILLE REDEFINES TRANSIT SURVEY – May 2013

Survey results will be used in planning and prioritizing improvements to ART. The City is working on this survey in partnership with Voices for Economic Justice leaders from Just Economics, Just Folks, and the Asheville Homeless Network.

9. Evaluate the changes in ART services made last year:
(1=Worse, 5=Greatly Improved, ?=Don't know)

	1	2	3	4	5	?
Overall Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Route lengths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Destinations served	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transfer points/times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
On Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Start times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
End times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sidewalks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cleanliness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operator Courtesy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Info	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

← Fig 1. Evaluate Changes Made

Fig 2. Changes Desired →

13. How important are the following transit system changes to you? (1=Not important; 2=somewhat important; 3=Very important)

	1	2	3
Maintain existing service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sunday service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More bus stops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More frequency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More routes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More sidewalks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More shelters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
An all night bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easier way to report problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More enforcement and separation of smokers/nonsmokers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety for riders traveling with children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More riders who HAVE to ride the bus on the Transit Commission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Create additional stops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If so, where? _____

Other changes? _____

Methodology

- Tool of Analysis: Logistic Regression
- To look at the need for equitable planning in ART decisions, income needed to be contrasted with rider preferences.
- Median income taken from income categories, income logged for more consistent results. Minimized the differences in income in the higher categories – large gap between lowest and highest income riders.

22. What is your annual household income?

- | | |
|---|---|
| <input type="checkbox"/> Under \$10,000 | <input type="checkbox"/> \$35,000- \$49,999 |
| <input type="checkbox"/> \$10,000- \$14,999 | <input type="checkbox"/> \$50,000- \$74,999 |
| <input type="checkbox"/> \$15,000- \$24,999 | <input type="checkbox"/> \$75,000- \$99,999 |
| <input type="checkbox"/> \$25,000- \$34,999 | <input type="checkbox"/> Over \$100,000 |

Methodology

- Data analysis done using SAS
- Response variable = categorical survey response, such as WhyBus, ImportantNight, ImportantSTOPS
- Income=predictor variable
- 3 statistical measures looked at to confirm significance: P-Value, Odds ratio, and confidence interval for odds ratio
- Tested all potential responses from question 9 (changes made) and question 13 (changes desired)

Results

- Analysis found that as income goes up, more people choose to ride the bus instead of the bus being their only option. ($p < 0.0001$)
- Analysis also found highly significant, negative relationship between an increase in income level and importance level of changes made and changes desired.
- Both of these findings support the premise of using ART as a case study for equitable planning, because the lower income ridership places more importance on most aspects of the system.



Bus Shelter,
Merrimon Ave at
Chestnut Ave

Results – Rate ART Changes, ***= significance

Variable	P-Value	Odds Ratio	Odds Conf. Int.
DestinationsChange	< 0.0001***	0.705	0.595-0.835
TransfersChange	< 0.0001***	0.707	0.597-0.838
SchedulesChange	0.0008***	0.751	0.635-0.888
OnTimeChange	0.0024***	0.773	0.655-0.913
FrequencyChange	0.0217***	0.825	0.698-0.974
StartChange	0.0014***	0.760	0.642-0.900
EndChange	0.0039***	0.781	0.660-0.923
SafetyChange	0.0001***	0.710	0.599-0.842
SidewalkChange	0.0374***	0.835	0.706-0.988
CleanlinessChange	0.0134***	0.837	0.682-0.956
CourtesyChange	0.0002***	0.725	0.612-0.859
InfoChange	0.0090***	0.798	0.674-0.945



SidewalkChange – More Sidewalks

SidewalkChange	0.0374***	0.835	0.706-0.988
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Low income survey respondents overwhelmingly picked additional sidewalks as one of the most important changes that ART made in 2012.



A bus rider carries her bags of groceries across Tunnel Road.
Asheville Blade, "These Streets Aren't Made for Walking"

Results – “How important are the following transit system changes to you?”

***= significance

Variable	P-Value	Odds Ratio	Odds Conf. Int.
ImportantSunday	< 0.0001***	1.360	1.105-1.674
ImportantSTOPS	< 0.0001***	1.717	1.433-2.056
ImportantFrequency	< 0.0001***	1.252	1.042-1.504
ImportantRoutes	< 0.0001***	1.340	1.119-1.604
ImportantNight	< 0.0001***	1.495	1.248-1.791
ImportantReport	< 0.0001***	1.473	1.232-1.760
ImportantShelters	< 0.0001***	1.520	1.264-1.829
ImportantSafeChild	0.0004***	1.393	1.160-1.672
ImportantAddStops	<0.0001***	1.414	1.171-1.707
ImportantCommission	0.0001***	1.209	1.005-1.453

Important Stops – More Stops

ImportantSTOPS

< 0.0001***

1.717

1.433-2.056

A highly significant P-value and the highest odds ratio make more stops a primary concern for low-income ART riders.



ImportantNight – Increased Night Service

ImportantNight	< 0.0001***	1.495	1.248-1.791
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- Most ART routes operate on a frequency of once per hour
- Latest ART bus currently is N1 route, servicing UNCA. Last trip leaves at midnight Thurs-Sat (UNCA subsidizes this bus extension)
- Most buses end 6-8 PM.
- Easy to miss a bus on a corridor not frequently served and end up having to walk or call private transportation

ImportantShelters – More Bus Shelters

ImportantShelters

< 0.0001***

1.520

1.264-1.829

- Safety issue, as well as ridership comfort issue



Bus riders waiting in the rain,
Asheville Citizen Times



A bus stop with no shelter, by the side of the road.

Conclusion

- Transit system changes are overwhelmingly important to low-income ridership
- However, logistical concerns sometimes delay changes riders need
- Funding environment: In 2014, NCDOT's operating budget was \$4.3 billion, only 0.002% of that appropriated to public transit
- Proposals are currently in congress to severely cut federal transportation funding by 43%, especially affecting rural and small counties (American Public Transportation Association)
- Good news is that transit ridership is up: a record 10.7 billion trips were taken using public transit in 2013, the highest ridership in 57 years (American Public Transportation Association)

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